Space Weather Forecast

Issued on Wednesday, 20 April 2022 at 01:07 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate-class flares likely throughout (R1/R2 radio blackouts). Slight chance of Strong flares (R3 radio blackouts). Increasing but slight chance of S1/Minor radiation storms.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate over the past 24 hours, with Moderate-class flares from a large region in the northeast and from a region which has recently rotated off the southwest limb. There are currently five sunspot regions on the visible disc. Of these, two close together in the northeast are by far the largest and most complex, and these represent the majority of the current flare risk alongside the declining risk from the region over the southwest limb as it rotates away. The other regions currently appear simple and stable, although one in the far northeast is still a little close to the limb to be certain of the analysis. No Earth directed Coronal Mass Ejections (CMEs) were seen in available imagery in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind showed declining coronal hole fast wind characteristics through this period. The solar wind speed has declined slightly from around 510-570 km/s to vary between 440-470 km/s. The Interplanetary Magnetic Field was weak throughout, with the north-south component also varying weakly. Geomagnetic activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed in the period.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is likely to be Moderate over the next four days, with a slight chance of Strong flares, mainly from the large and fairly complex regions currently in the northeast quadrant of the Sun.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs in the forecast. Earth is likely to continue exiting from the current coronal hole fast wind during Day 1 (20 Apr). A further low confidence enhancement is possible on Day 2 (21 Apr) from another coronal hole, although this has been closing up as it moves across the disc. If this enhancement does not occur, near background wind speeds are expected from Day 2 onwards.
Geomagnetic activity is expected to be mainly Quiet to Unsettled, with a Slight Chance of Active or G1/Minor Storm intervals if we see a fast wind arrival during Day 2.

Energetic Particles / Solar Radiation: Solar radiation storms are not expected, although there is a very gradually increasing risk as the most complex sunspot regions rotate westward with time.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	70	70
Very Active	R3 to R5 X	No	15	15	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	7	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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